2011 TREADMILL SERVICE MANUAL

TRUE

Proprietary & Confidential
TRUE Fitness Technology, Inc.

WARNINGS

TRUE

Hazardous Voltages and High Speed Moving Parts

DANGER

This True Fitness Technology Inc. equipment contains hazardous voltages and high speed moving parts. Contact with these hazards will potentially cause death, serious personal injury or may damage equipment.

Only qualified personnel, (as outlined below), should install, operate and maintain this equipment. Always properly ground equipment and lock out electric power, (de-energize), before maintenance,(unless instructed to power equipment as part of a test procedure or an electrical check). True recommends the use of safety glasses when servicing equipment.

Using non-specified / unauthorized parts or components to repair equipment, or tampering with safety devices/systems will result in dangerous conditions which can potentially cause damage to equipment, severe personal injury or death. Take note of and follow all safety instructions contained in this manual.

IMPORTANT

This service manual does not claim to cover all detail or variations in True Fitness equipment. Nor does it provide for all possible conditions encountered while installing, operating or maintaining this equipment. If further information is desired or needed to address any particular installation, operation or maintenance problem not covered in this document, contact your authorized factory representative at 800-883-8783.

(Exercise good judgment in selecting the appropriate tools for each repair application).

NOTE

It is the policy of True Fitness Technology Inc. to continuously work toward product improvement. We reserve the right to change product design and specifications without notice. Specifications within this manual are subject to change without notice.

QUALIFIED PERSONNEL

For the purpose of this manual, a qualified person is one that is :

a. Preferably, a technician certified through True Fitness Technology, Inc. service school and / or a technician from an authorized True dealership.

b. A service technician trained on comparable fitness equipment, currently employed as a fitness equipment technician and experienced with the hazards involved with its installation, operation and maintenance.

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Entering Diagnostics

2 WINDOW DISPLAY

- Press CLEAR ENTRY until the screen blanks then press hold ENTER. [or Hold speed Up (⇧) Key while inserting safety key]
- A. Input 10101 (Basic Mode) B. Input 20173(Service Mode)

1. Units (English)
2. Max Time (99)
3. Default Time (30)
4. Reset (60 sec)
5. Sound (On)
6. Default Weight (150)
7. DM LC Backlight (45)
8. DM Contrast (40)
9. MC Backlight (9)
10. MC Contrast (35)
11. HR Priority (0)
12. C-Safe Enable (Disabled)
13. Reset Model Def (not used)
14. Error Log 1-5

1. Version
2. Hours
3. Distance
4. Program Starts
5. Display Test
6. HR Test
7. B Light Test
8. Contrast Test
9. LCB Control Test
10. CS/BV Test
11. Smartcard/Motor Board
12. Remote Key Test
13. Current Test(RPM only)
14. Safe Switch Test
15. Program Usage
16. BV Setup
17. Watch Dog Test

To exit : Press Start – Watch Dog Test will count down & system will clear

11” WINDOW DISPLAY

- Press CLEAR ENTRY until the screen blanks then press and hold ENTER:

A. press 10101 (Manager Mode)

1. Hours
2. Distance
3. Units
4. Max Program Time (99)
5. Def Program Time (30)
6. Reset Time (30)
7. Audible Sound (On)
8. Def Weight (150)
9. Cool Down (Disable)
10. Contrast (160)
11. Left BK LT (63)
12. Right BK LT (63)
13. HR Priority (Tele)

Error Log 1-5.

B. Press 20173 (Service Mode)

1. Version Test
2. Checksum #
3. Display Test
4. Keyboard Test
5. HR Test
6. LWR CNTL BD Test
7. LCD Settings Test
8. Aux Board Test
9. Vart Test
10. Safe SW Test
11. BV Setup
12. Watch Dog Test

11” WINDOW DISPLAY (cont.)

C. Press 48362 (Configuration Mode)

1. Model
2. Max Speed
3. Max Grade
4. Hours
5. Distance
6. LCD Contrast
7. Left Backlight
8. Right Backlight
9. HR
10. Elevation Cal
11. Gear Ratio
12. Grade Max %
13. Cool Down
14. Max Program Time
15. Default Program Time
16. Reset Time
17. Language

15” Touch Screen

The Maintenance Mode is designed to help the tech determine certain faults in the upper control boards and feedback from the brake system.

Press and hold the top left corner of screen until the True emblem will begin to flash after 4 seconds.

Press and hold Manual Workout Button to reveal list of options

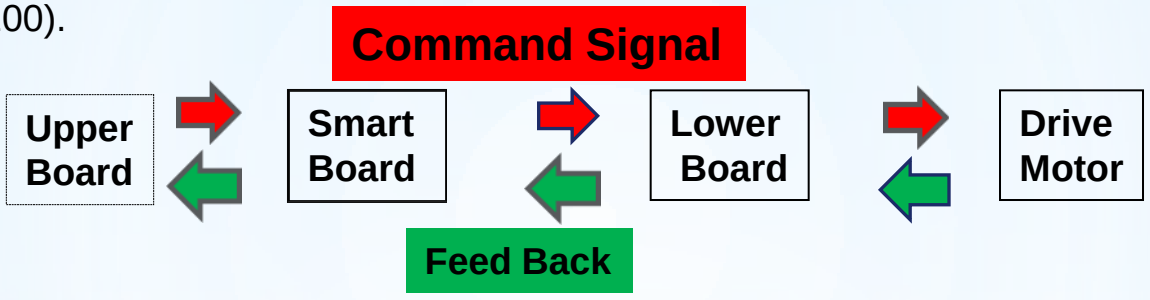
1.Configure (Displays the current model setup)
2.Calibration (Speed / Elevation Calibration)
3.Diagnostics (Check hours, distance, error log)
4.Production Tests (Test various functions)
5.Utilities (Install software, TV tuner setup, touch screen setup)

SYMPTOM GUIDE

A. DRIVE SYSTEM OVERVIEW

In this summary we are going to cover basic troubleshooting techniques used in the industry to diagnose and repair True Fitness treadmills more quickly and efficiently. Current True treadmills use 3 types of drive system:

1. AC DRIVE WITH SMART CARD INTERFACE (TCS Series and TLC1100).



The new TCS Series treads with the smart card system utilize a digital signal for both command and feedback. This signal cannot be tested with normal field equipment. Diagnostics must be done using the status lights on both the lower control board and smart card.

2. DC DRIVE WITH SMART CARD INTERFACE (TES900, TLC900 and TPS850)

This system is basically the same as the above AC smart card system; however, no motor transmit and receive LEDs are lit on the DC smart card.

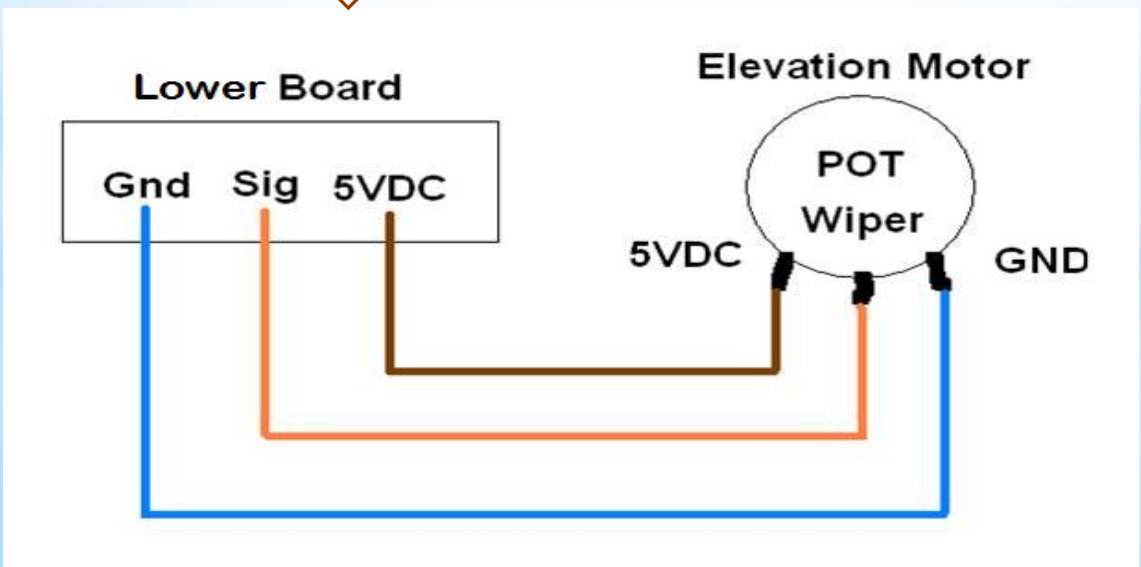
3. DC DRIVE (All TPS series except TPS850, Z5 series)

This system is the same as all our traditional DC drive systems

ELEVATION SYSTEM OVERVIEW

- The elevation systems on all True Treadmills use AC (Alternating Current) motors to lift the treadmill to the desired elevation. This system uses a command from the upper control board that is sent to the lower board which in turn sends an AC voltage to the windings of the elevation motor. There are two sets of windings on the AC incline motor, one for each direction of motor movement. The elevation motor has a potentiometer that sends a feedback voltage back to the upper control board. This voltage is converted into a digital signal and is displayed on the upper board during Calibration Mode *(see pg 47).*

  - Note: On units with Smart Board -> 5 volts originates at Smart Board. All other units, -> 5V originates at upper board



ELEVATION SYSTEM OVERVIEW *(CONT.)*

- How this feedback is displayed varies with different models and different consoles:

Treadmill Series	Digital Value	Notes
CS 500, 550, 800 & ES900 with **Touchscreen With decline foot**	14000 - 16000	At zero incline the incline digital value displayed in calibration mode reads approx. 14000 - 16000. The DC voltage across the orange and blue wires of the potentiometer should read approx. 4.47 . As the treadmill inclines, the displayed value increases while the VDC decreases.
CS 500, 550, 800 & ES900 with **Touchscreen No decline foot**	6500 - 8500	At zero incline the incline digital value displayed in calibration mode reads approx. 6500-7500. The DC voltage across the orange and blue wires of the potentiometer should read approx. 4.47 . As the treadmill inclines, the displayed value increases while the VDC decreases.
CS 550/800 & PS series with **11" console**	28	At zero incline the incline digital value displayed in calibration mode reads approx. 28. The DC voltage across the black and white wires(TPS series) or (orange and blue on TCS series) of the potentiometer should read approx. 4.47 VDC . As the treadmill inclines, the displayed value increases while the VDC decreases
CS 500,LC series, PS series with **2 Window**	228	At zero incline the incline digital value displayed in calibration mode reads approx. 228. The DC voltage across the orange and blue wires of the potentiometer should read approx. 4.47 VDC. As the treadmill inclines, the displayed value decreases while the VDC decreases.

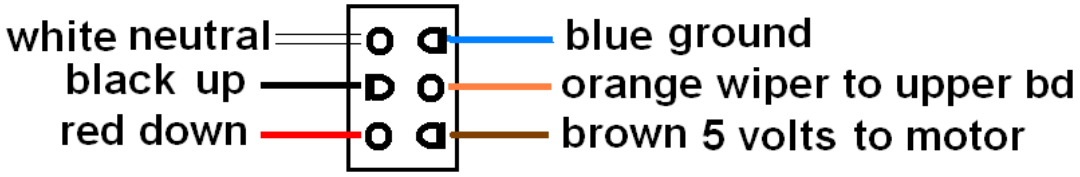
ELEVATION OVERVIEW *(CONT.)*

D. TCS800 w/ touchscreen console:

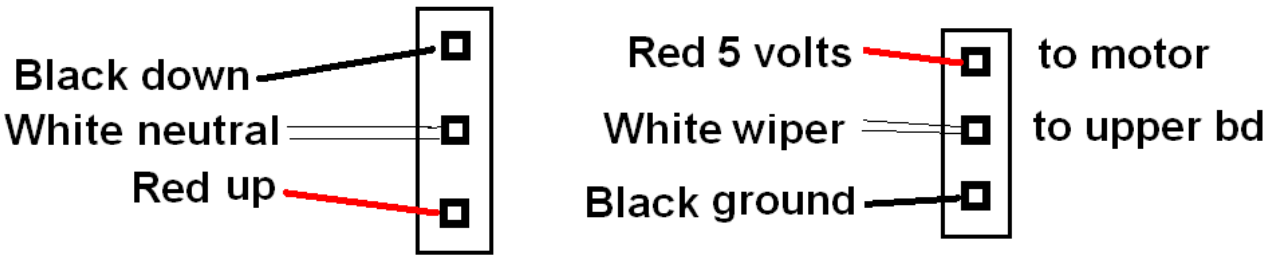
At zero incline the incline digital value displayed in calibration mode reads approx. 14000-16000. The DC voltage across the orange and blue wires of the potentiometer should read approx. 4.47 . As the treadmill inclines the displayed value increases while the VDC decreases.

True Fitness uses 2 different connector combinations for Elevation Motors.

PS1100,900, ES Series, CS Series and Z Series



PS 100,300,600 and 800 Seperate power and feedback connectors



B: ERROR CODES

GENERIC ERROR CODES		
Error	**Reason**	**Resolution**
E1 RANGE	Elevation feedback values are out of the minimum or maximum range.	Pg. 15-16
E1 STALL	Elevation feedback value does not change when elevation motor is commanded.	Pg. 15-16
E2 CAL	Speed feedback is too far out of the calibrated range.	Pg. 17
E2: OVERSPEED	Belt speed ramping too fast. Can be caused by same issues as E2 CAL	Pg. 17
E2: RECAL/ E3 EPROM	Computing error of upper board processor.	Call Tech Support for further troubleshooting.
E4: STUCK KEY	Control button continuously activated.	Replace overlay. On machines with center pod overlay, disconnect center pod overlay cable to determine which overlay is defective. On TPS series treads, surface mounted switches activate control. Remove switch board from front plastic to determine if functioning properly
E5: SENSOR (aka NO SPEED PULSE):	Upper control board detecting any or below acceptable speed.	Pg. 17-22

ERROR CODES ASSOCIATED WITH NEW SMART CARD

WRONG CONFIG: Smart card not compatible with configuration. *Check configuration of upper console.*

SMART CARD COM: Lost communication between smart card and upper control board. *Check main data cables for continuity and proper connections. Check status LEDS on smart card.*

MOTOR MISMATCH: Motor type (AC vs DC) doesn't match smart card type (AC vs DC).

INCLINE REV ERROR: Elevation direction is reversed. *Most likely cause is incorrectly installed separate potentiometer cable on TPS style incline systems. .*

INCLINE OPEN: Elevation motor is disconnected. *Check all elevation connections. Check continuity on elevation and data cables*

RPM MISMATCH: Belts moving speed from RS232 cable does not match RPM detected by smart card. *Most likely caused by improper model configuration*

CONSOLES BD LOST: Console's communication is lost. *Check continuity of data cable and connections.*

MOTOR BD COMM (AC ONLY): The motor controller's communication is lost between controller and smart card. *Check connections and cable continuity between smart card and lower control board. Make sure RS232 cable is orientated correctly.*

E1 STALL

The elevation up and down LED's on the lower boards of all True Fitness Treadmills are used for elevation troubleshooting.

These LED's illuminate when a command is received from the upper control board to raise or lower the incline.

If there is no illumination of incline LEDs, check data cable for continuity.

If there is illumination of a incline LED and no motor movement listen to the motor.

If there is a humming noise coming from the motor and no movement, replace the motor.

If the LED's illuminate and there is no motor humming, check the 3 amp slow blow fuse on the lower board for continuity. This fuse protects the 18 volt system that controls the elevation relays. If there is no continuity, replace the fuse.

If the fuse blows a second time replace the lower board.

Caution! Unplug unit before removing fuses!

E1 STALL/ E1 RANGE

- If the value at zero or -3% incline is outside the acceptable range (see pg. 11) of the correct digital value, the machine will give an elevation error (either E1 Stall or E1 Range depending on model).
- On units with an external limit switch, the digital value can be adjusted by disconnecting the elevation motor from the incline rack and manually turning the linear shaft of the incline motor until it reads the correct digital value at 0% or -3%.
- On treadmills with internal limit switches in the incline motor the ideal zero will be set when the internal switch activates.
- A value reading 255 or 0 often indicates over travel of the potentiometer or a wire disconnect between the potentiometer and the upper control panel.

E2 CAL

- This error will occur if the upper and the lower boards lose their calibration parameters. See calibration procedure(pg 47)

Note: May be caused by speed fluctuation.

•Check for high friction by performing a Push-off test.(pg 35)

•To perform this test raise the elevation to the highest level and remove safety key.

•While standing on the belt push away from the handle bar.

•If there is high friction between the belt and deck it will be difficult to push away.

•Units with low friction will be easy to push away.

•High friction can lead to excess amp draw on the motor. The motor may overcompensate causing an error code. If this is not addressed, it will lead to motor controller failure.

•Replace running belt and deck as needed

•Check the line voltage for fluctuations. This can cause erratic speeds.

E5 SENSOR

E5 Sensor Error (without belt movement):

If the upper control board does not see adequate feedback from the speed sensor when the belt is being commanded to move this error will occur.

This error can occur for different reasons which we have listed below.

First, if there is a break in the main data cable, the speed feedback information will not make it back to the upper board.

Check to see if there is **speed feedback in the upper board while in calibration.**

Next check continuity on the data cable to verify there is no break in the connection.

If the upper board command signal is not being received at the lower board there will be no belt movement.

E5 SENSOR

E5 Sensor (without belt movement.)

AC DRIVES:

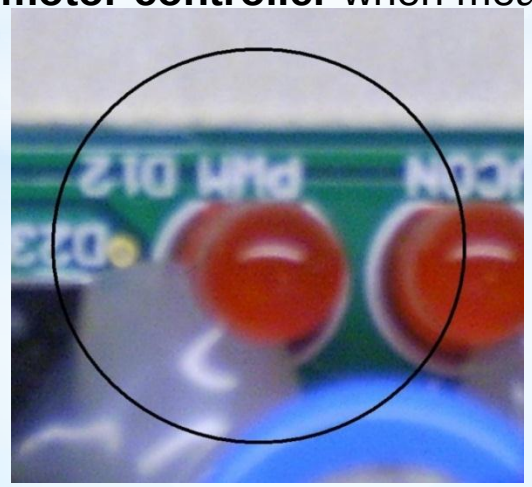
The AC Drive on the CS Series Treadmills has a unique error reporting system that helps in the diagnostic troubleshooting of system faults. To read errors- count the blink code that flashes on the lower board LED's 1, 2 and 3. *(see pg 42)*

Note: This blink code will only display as long as the lower board has not been reset. There currently is no drive fault error reporting on the upper board.

DC DRIVES:

Check to see if the PWM light is lit on the lower board. If this LED is illuminated there should be belt movement and there should be AC or DC voltage being sent to the motor depending on the type of drive system in question.

Measure the output pins (to the drive motor) on the lower board. When checking output voltage the **motor or load must be connected to the motor controller** when measuring this voltage.



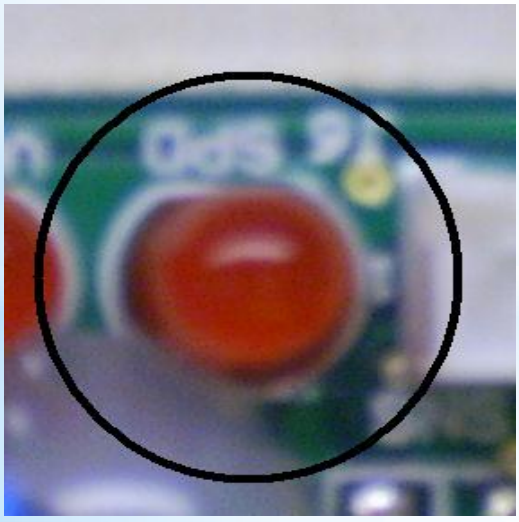
E5 SENSOR

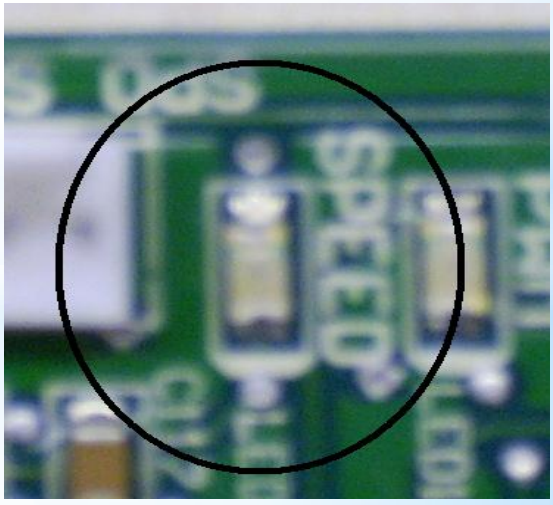
E5 Sensor (Belt moves for 5-10 seconds.)
No Speed Sensor Feedback

First check to see if the RPM light flashes on the lower board *(and the Smart Board-if applicable)* when moving the drive motor and running belt by hand.

If there is no LED flashing on either board proceed to the following steps. If the LED flashes perform a continuity check on the data cable. If the cable checks good, replace the upper board.

All current production models have a RPM LED on the lower boards.





E5 SENSOR

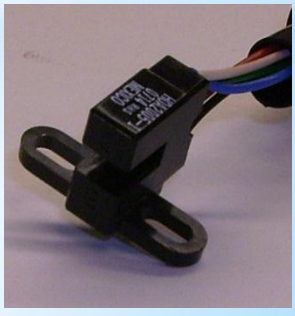
E5 Sensor (Belt moves for 5-10 seconds) Cont.

A misaligned or damaged speed sensor can cause an E5 Sensor error after pressing start and no sensor feedback is detected after 10 seconds.

1. An **optical sensor** is used on our newer AC drive systems for the TCS Series (Reads off wheel on drive motor)

On the optical sensor, measure DC volts between pins 2 and 3 of the speed sensor plug while plugged into the lower board. There should be a reading of 5VDC(on) to below 1VDC(off). Readings of 1.90VDC or higher during the off cycle could cause the RPM LED to not cycle and will result in a speed error.

If this speed sensor test is successful **replace the lower board.** If the speed sensor test fails **replace the speed sensor.**



E5 SENSOR

E5 Sensor (Belt moves for 5-10 seconds) Cont.

Check to see if the speed LED flashes on the lower board when moving the belt by hand.

If there is a flashing speed LED on the lower board, enter calibration and check for speed feedback in the upper panel display.

Check the data cables for continuity or try a known good 20 pin cable between the MCB and the Smart Board and the 10 pin console cable. If there is still no speed feedback in the upper panel, **replace the upper panel.**

E5 Sensor (only occurs under load)

Most common cause his high belt and deck friction. Perform amp draw test on pg: 29

C. MISC SYMPTOMS

NO CONSOLE DISPLAY

A. ALL CONSOLES EXCEPT TOUCHSCREEN

- Check the obvious! Make sure there is AC voltage available at the outlet, check the breaker on the unit to see if it is tripped, and look for any visible damage on the power cord and data cable.

- Check the AC and the VCON (11VDC) LED on the lower board to see if they are illuminated; if these LEDs are not illuminated there will not be 11VDC available to the upper control board. Check the fuses on the lower board.

- If the AC and VCON (11VDC) LEDs are lit and there is still no display look for damage on the data cable, and check for 11VDC on the data cable at the control board. Refer to the unit's wiring diagram for the print out on the specific data cable being tested.

- If there is 11VDC from the data cable at the display, the board should power up; if not, **replace the control board**.

B. TOUCHSCREEN ONLY

- If console is a touchscreen, power comes from a 12 VDC power adapter in base of unit. Check for power LED on adapter. If on, check for 12 VDC at console connection.

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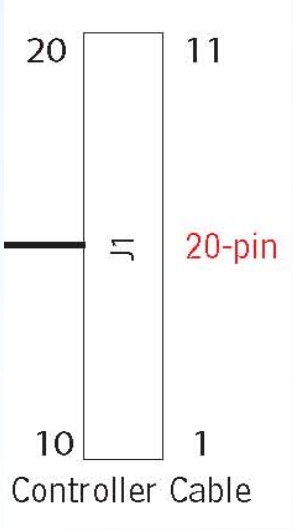
NO CONSOLE DISPLAY

20-PIN CONTROLLER CABLE	
PIN	FUNCTION
1	GND
2	MOTOR CURRENT A/D
3	A/D REF GND
4	INCLINE POT WIPER A/D
5	GND
6	INCLINE UP CMD
7	INCLINE +5 VDC A/D
8	INCLINE DOWN CMD
9	GND
10	PWM SPEED COMMAND
11	+12 VDC
12	RPM SPEED SENSE
13	+12 VDC
14	RUN ENABLE
15	+ 12 VDC
16	BRUSH WEAR SENSE
17	DRIVE FAULT
18	ZERO % INCLINE
19	NOT USED
20	SHIELD-CHASSIS GND

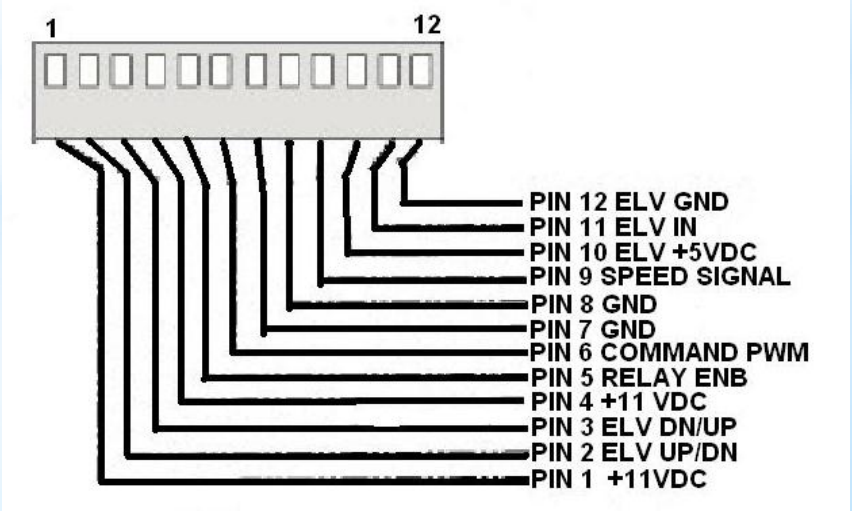
20 PIN CABLE PINOUT

Z SERIES, TPS800-900



12 PIN CABLE PINOUT

PS 75,100, 300



Heart Rate Not Functional or Erratic Readings

Locate any RF sources and use a process of elimination. Common sources of RF interference include: invisible fences, Wi-Fi networks, cordless phones, cell phones, radios, home security sensors, etc.

Verify the Polar HR with an alternate heart rate strap. If the Polar strap is good, **replace the Polar HR receiver**. If the Polar strap is bad, **replace the strap**.

Verify that the treadmill is connected to a dedicated line, 15 amp circuit, and is not on an extension cord. Do an outlet test to check for 110V to 120V on the wall outlet.

Ensure that the Polar HR receiver is not touching any metal and is mounted with the wires in a vertical position with the receiver facing the runner.

If HR receiver is mounted correctly but still not Polar HR, **replace the Polar heart rate receiver**.

Check for contact heart rate using the grips.

If no heart rate through grips, check for continuity through the grips to the upper computer board.

If there is no continuity through the grips to the computer board, **replace the grip assembly or HR wires.**

FAN NOT OPERATIONAL

All universal consoles have an auxillary power cable which imports 12VDC from the lower control board. A second 2-pin cable exports this power to the fan. Make sure all cables are properly connected and that 12 VDC is being supplied throughout the system.

NOT DETECTING SAFETY KEY

Causes:

- Safety switch wire not connected properly. *Commonly plugged into fan connection not SAFE SW connection on universal console control board.*
- Defective safety switch: *Check continuity of cable with known good magnetic safety key.*
- Wrong safety key or key is missing magnet.
- Internal issue with control board. *Jumper across the two pins of connection on upper board. If the control board does recognize safety key, problem is external.*

NO SOUND OR NOT FULL RANGE OF CHANNELS DETECTED ON WIRELESS CONSOLE

- *Only applies to 2 window or 11" LCD consoles with wireless card option.*
- *Reprogram wireless card (see pg: 51-52)*

TOUCHSCREEN BUTTONS NOT RESPONDING

- NEEDS SCREEN CALIBRATION:

1. Press and hold the upper left corner of HOME screen until the logo on HOME screen begins to flash on and off. Stop pressing left corner.

2. Then press and hold the MANUAL WORKOUT key in the bottom right corner of the HOME screen. The MAINTENANCE screen will appear at this point.

3. Press the UTILITES button.

4. Press the TOUCHSCREEN CALIBRATION button.

5. Follow the on screen instructions to CALIBRATE your display. Once all TARGETS have been pressed, press the blue HOME button to complete TOUCHSCREEN CALIBRATION.

Touch Screen Will Not Function When buttons pressed

- PERFORM CALIBRATION OF TOUCH SCREEN

1. Press hold: UP grade and MINUS speed

2. After 10-15 seconds touch screen calibration will display.

3. Software version:
   - If software version below (<)1.8 Press each of the **3 "targets"** as they appear on the screen.
   - If software version above or equal to (>=) 1.8 Press each of the **9 "targets"** as they appear on the screen

4. When step 3 is complete press "HOME".

5. Check for function of the touch screen.

6. If touch screen continues to not function replace console.

NO IPOD DETECTED

1. Try newer generation IPOD. The universal consoles will only detect latest generation IPODs.
2. Reset IPOD
3. Improper screen calibration can affect the consoles ability to detect IPOD. See above for instructions.

NO TV OR POOR PICTURE QUALITY

1. Improper TV tuner set-up.
See pg: 46-48 for instructions.

2. *Poor Coax connection.*
Check all connections. Run external coax line directly to back of console to bypass internal connections for help in troubleshooting

3. *Insufficient signal strength.*
Please note for optimal TV image results, sufficient signal strength must be received by the Touch Screen display. It is the responsibility of the customers' facility to provide the optimum signal strength values listed below to each individual exercise machine.

TUNER ---->	NTSC / ATSC TUNER - 75 ohm					
SIGNAL FORMAT --->	NTSC (analog)			ATSC (digital)		
MEASUREMENT UNIT --->	dBmV	dBm	dBuV	dBmV	dBm	dBuV
MINIMUM --->	0	-48.8	60	-10	-58.8	50
MAXIMUM --->	15.5	-33.3	75.5	15.5	-33.3	75.5

AC Amp Draw Test (All Models)

1. Place an AC clamp meter around the black incoming power lead.

2. Let the treadmill run at 2.5 mph and 5.0 mph.

3. At 2.5 mph the treadmill should be drawing 0.5 -1.5 AMPS AC. (No Load)

   At 5.0 mph the treadmill should be drawing 1.5 -2.5 AMPS AC. (No Load)

4. Walk on the treadmill at 2.5 mph and 5.0 mph.

5. At 2.5 mph the treadmill should be drawing 2.0-4.0 AMPS AC. (Load)

   At 5.0 mph the treadmill should be drawing 3.0-6.0 AMPS AC. (Load)

6. Higher than normal amp draws without load may signal that running belt tension is too tight or that there is a problem in the drive motor or controller.

7. If amp draw is higher than expected only under a load, lubricate the running deck and running belt. If amp draw is still high, **replace the running deck and running belt**. Higher than normal amp draws signal running belt and running deck friction which may require lubrication or replacement.

Speed Sensor Test (TPS Series/ Z Series)

This test will expose the technician to a potential pinch hazard. Exercise caution when performing test.

1. Remove the motor cover and verify that the speed sensor is between 1/8” to 1/4” away from the roller pulley (TPS Series, Z series).

2. Turn the flywheel on motor so that there is belt movement. Verify that the speed LED blinks on the lower board when there is movement at the speed sensor.

3. If the Speed LED does not blink, **replace the speed sensor**.

Optical Sensor Test (TCS Series)

On the optical sensor, measure DC volts between pins 2 and 3 of the speed sensor plug while plugged into the lower board. There should be a reading of 5VDC(on) to below 1VDC(off). Readings of 1.90VDC or higher during the off cycle could cause the RPM LED to not cycle and will result in a speed error.

If this speed sensor test is successful **replace the lower board.** If the speed sensor test fails **replace the speed sensor.**

Incline Potentiometer Test

This test will expose the tech to a potential shock hazard. Exercise caution when performing this procedure.

This test is designed to help the field tech determine if the incline motor potentiometer is properly set.

1. In calibration mode, before pressing START, the upper console shows the incline digital value in the display window.

2. With the treadmill set at zero incline or -3% incline for decline units, refer to elevation overview for correct digital value that corresponds to model and console configuration.

3. This number will move up or down in value depending on the model. Most PS treadmills digital value will move up from 20-30.

4. A digital value of 0 or 255 often indicates a control cable open or a failure of signal to panel.

Incline Potentiometer Test (Cont.)

The upper console provides 5VDC to the incline POT through the console cable. The 5VDC runs through the POT and that voltage changes according to the position of the POT, then it is sent back to the upper console where it is converted into a digital value as it is seen in the display in calibration mode.

Verify the POT voltage across the potentiometer connection by testing for voltage on the elevation POT cable on the controller. See lower board drawing for specific location.

NOTE: Unplug treadmill before disconnecting and reconnecting cables.

1. Power treadmill up and test the following.

2. Voltage across 5VDC and GND should be 5VDC.

3. Voltage across the signal and Ground should be approx. 4.5 VDC at zero incline. As the unit inclines, this value decreases.

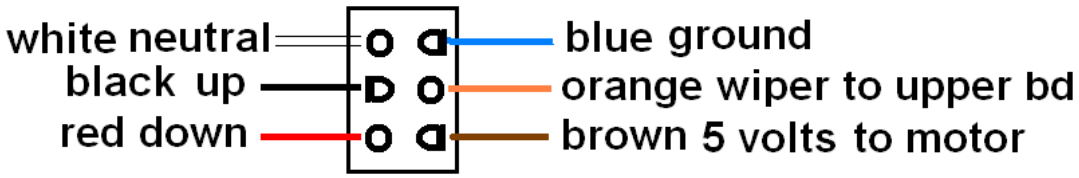
4. Voltage across the 5VDC and signal should be approx 0.50VDC at zero incline. As the unit inclines, this value increases.

NOTE: All the above voltages are while the unit is at zero incline, or on units that have decline- minus 3.

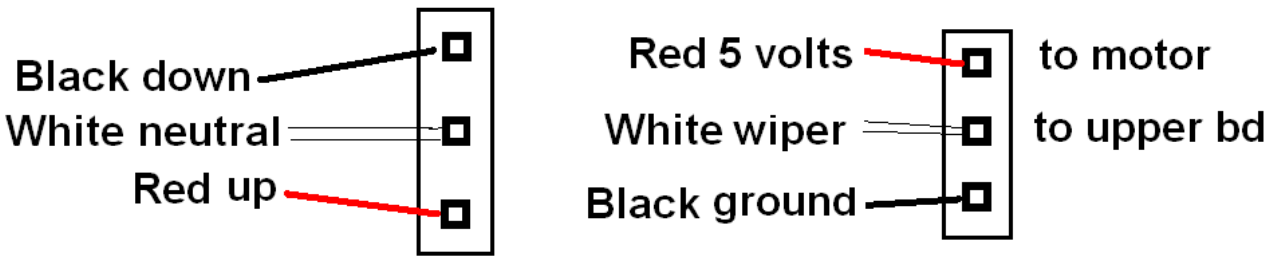
Incline Potentiometer Test (Cont.)

True Fitness uses 2 different connector combinations for Elevation Motors.

PS1100,900, ES Series, CS Series and Z Series



PS 100,300,600 and 800 Seperate power and feedback connectors



Voltage to Incline Motor Test

This test will expose the tech to a potential shock hazard. Exercise caution when performing this procedure.

1. Switch power to treadmill off and disconnect from wall.
2. Set voltmeter to Volts AC.
3. Place the voltmeter leads across the black and white wires of incline power cable while cable is plugged into controller.
4. Plug treadmill power cord into wall and power up.
5. Enter calibration mode.
6. With the leads attached, push the UP button on the console. A reading of 110V to 120V AC indicates normal output.
8. A reading of 0 VAC indicates no output.
9. Switch power to treadmill off and disconnect from wall.
10. Place the voltmeter leads across the white and red wires.
11. Plug treadmill power cord into wall and power up.
12. With the leads attached, push the DOWN button on the console.
13. A reading of 110V to 120V AC indicates normal output.
14. A reading of 0VAC indicates no output.

Push Off Test

1. Place the treadmill in calibration mode.

2. Elevate the treadmill to the highest elevation level.

3. Standing on the running belt, close to the console, push yourself off with moderate force.

4. The elevation, combined with your weight and the force of the push, should cause the belt to carry you at least 3/4 of the running belt length.

5. If the test does not carry you 3/4 of the running belt length, lubricate the running belt and running deck using only **TRUE** proprietary lubricant.

NOTE: Use only **TRUE** supplied silicone. Use 1/4 of bottle provided with the treadmill or one packet of **TRUE** silicone. Lubrication should be applied every 5 1/2 months. If the machine is used for more than 3-4 hours per day, lubricate every 3 months.

6. After lubricating the running belt and running deck, perform the push off test again.

7. If the treadmill does not carry you 3/4 of the running belt length after lubrication, replace or flip the running belt and running deck.

Running Belt Tension Test

***NOTE**: Running belt and deck wear and/or lack of lube can cause the belt to show symptoms similar to a loose running belt. Check these conditions before a adjusting tension.

1. Set the speed to 2.5 mph and walk heavily on the running belt at, stomping against the running belt movement.
2. If the running belt hesitates or slips, **tighten both rear roller bolts 1/4 of a turn**.
3. Repeat step three until no hesitation or slip occurs. Also, check for these conditions at higher speeds.

***Note**: A loose drive belt will cause a similar hesitation under load*

CARE AND MAINTANCE

Running Belt Alignment Procedure

1. Power the treadmill up.
2. Press the START button and set the speed to 5 mph.
3. Watch the running belt tracking from the rear of the machine.
4. Adjust the rear roller to compensate for running belt misalignment.
5. If the running belt is tracking to the right, tighten the right rear roller bolt in 1/4 turn increments until the belt is properly aligned.
6. If the running belt is tracking to the left, tighten the left rear roller bolt in 1/4 turn increments until belt is properly aligned.

Silicone Lubrication Application Instructions

Commercial Only
Step 1: Perform push off test to determine need for lubrication.
Push Off Test
Place the machine in Calibration mode, elevate to the highest elevation- speed should be set to 0. Stand on the tread belt positioning yourself close to the console; push off with moderate force. The elevation combined with your weight and the force of the push should cause the belt to carry you at least ¾ of the way to the end of the machine**.** If the test does not carry you at least ¾ of the way to the end of the machine, lubricate the belt using True Fitness liquid silicone **(perform step 2 before lubricating).** After lubricating the belt/deck perform the push off test to verify proper lubrication.

Commercial Only
Step 2: Unplug treadmill from the wall. The deck & underside of the walk belt should be clean and free from any foreign matter. Use a clean cloth towel to remove debris from deck & underside of the walk belt.

Commercial & Residential
Step 3: Apply Silicone to treadmill.
The deck & underside of the walk belt should be clean and free from any foreign matter. Use a clean terrycloth towel to remove debris from deck & underside of the walk belt. Cut the corner of the single application lube packet and apply it to the foam surface of the applicator wand.
WARNING: DO NOT APPLY THE LUBRICANT ON EXPOSED SURFACES!
Lift edge of the running belt to expose the deck surface. Insert the applicator wand – foam side down- between the underside of the belt and the top of the deck. Generously apply the silicone lubricant to the deck surface from front to back using a back and forth motion. Repeat from the other side to insure coverage to the center of the deck. Remove the applicator wand; wipe the applicator clean & rubber band a plastic bag over the foam to prevent the foam from drying out.
Plug the power cord into the wall outlet & power up the unit. Walk on the treadmill at low speed to spread the lubricant evenly through the belt and deck. Machine is now ready for use.

TRUE 865 Hoff Road | St. Louis, MO 63366 | 800.426.6570 | fax 636.272.7148

truefitness.com

Care & Maintenance True Fitness Commercial Treadmill

Routine cleaning and preventive maintenance will help extend the life and reduce operating cost of your treadmill. Contact True Fitness (800) 883-8783 for assistance.

General Cleaning

Daily:

- Perspiration should be wiped down with a soft cloth, after a workout.

Weekly:

- Treadmill should be wiped down with a soft cloth, dampened with a diluted mild soap and water solution.
- Care must be given as to not get excessive moisture between the edges of the console overlay or touch screen.
- Do not use harsh cleansers or degreasers to clean the treadmill.
- Do not clean or wipe under the running belt.

General Inspections

Daily:

- Test Start and Stop key function.
- Inspect the safety key clip and tether damage or frayed areas.
- Test safety key function.

Weekly:

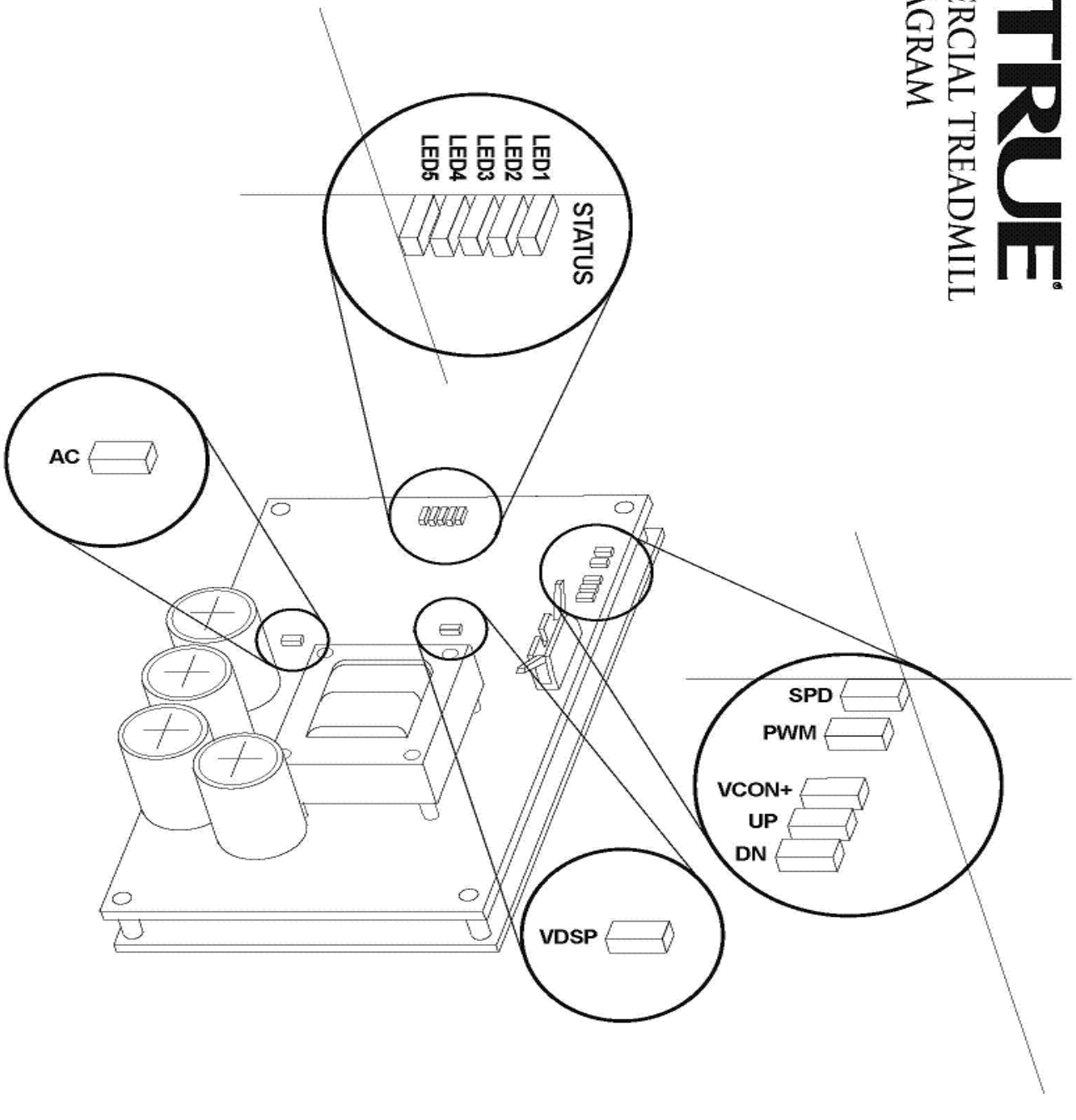
- Test IPod and headphone jack function.
- Inspect running belt for proper tension and alignment.
- Inspect the power cord for frayed or damaged areas and that it is clear of the elevation rack and pluged in completely

General Maintenance

Quarterly (every 3 months) Authorized True Fitness dealer or service provider should perform a full inspection and preventive maintenance.

- Inspect running belt for proper tension and alignment.
- Lubricate the running belt. Pre measured lubrication packets are available from True Fitness
- Inspect drive belt for cracks and proper tension/alignment.
- Vacuum out any partials from the motor compartment.
- Check all electrical connections for proper connection
- DC motors only, inspect motor brush wear.
- AC amp draw test with the treadmill under load and under no load.
- Lubricate the elevation motor's actuation screw.
- Inspect elevation rack assembly for cracks and that bolts are tight.
- Inspect that the pedestal screws, handrail screws, and motor cover screws are tight.

APPENDIX A: COMMERCIAL LOWER CONTROL BOARD



APPENDIX A: LED DESCRIPTION

LED	DESCRIPTION
AC	HIGH VOLTAGE PRESENT INDICATOR
VDSP	HOT SIDE POWER SUPPLY PRESENT INDICATOR
LED1	AUXILIARY STATUS LED
LED2	AUXILIARY STATUS LED
LED3	AUXILIARY STATUS LED
LED4	AUXILIARY STATUS LED
LED5	AUXILIARY STATUS LED/DIGITAL TO ANALOG OUTPUT
DN	DOWN ELEVATION SIGNAL PRESENT
UP	UP ELEVATION SIGNAL PRESENT
+VCON	UPPER CONSOLE POWER SUPPLY INDICATOR
PWM	PWM SIGNAL FROM CONSOLE INDICATOR
SPEED	SPEED PICKUP INDICATOR
AC LED	Turns on when AC power is applied and relay (K1) is closed. The motor controller may turn off the safety relay (K1) if a faulty is detected at power up. K1 relay is also controller from the upper console. CAUTION: The AC LED will stay on for a few minutes after the AC power is removed. This is because high voltage DC power is still present on board. Do not touch or remove board when this LED is illuminated.
VDSP LED	Turns on when the power supply to the motor controller is present. CAUTION: This is a floating ground (hot) and isolated from the chassis ground. Do not hook this ground reference to the chassis ground.
DN LED	This LED indicates an elevation down command is present on the controller.
UP LED	This LED indicates an elevation up command is present on the controller.
+VCON LED	This LED is illuminated when the power supply to the upper console is available to the controller.
PWM LED	This LED is illuminated when PWM signal from the upper console is present on the controller. The LED will increase in intensity as the PWM duty cycle increases. At high duty cycles, the LED would appear to be “on” all the time.
SPEED LED	This LED turns off each time the encoder wheel passes/is interrupted through speed pickup.

APPENDIX A: STATUS LED DESCRIPTION

Normal Operation	
LED's 1,2, & 3	sequence back and forth to indicate the processor is online and operational.
LED 4	used as a discrete/analog signal to the upper console. This LED remains illuminated when the treadmill is in run mode and turns off during SAFE MODE and STAND-BY MODE.
LED 5	Indicates system STATUS mode. a. SAFE MODE: When the controller's safety relay is not energized and no error exists , **LED 5 remains off.** b. STAND-BY MODE: When the safety relay is engaged but the system is not outputting an active PWM signal to the motor and no error exists, **LED 5 blinks on and off at a fast rate.** c. RUN MODE: When the system outputs an active PWM signal to the motor and no error exists, **LED 5 remains on.**

Fault Condition / Indication	
When a system error occurs, appropriate action is taken and the error is reported. All errors are given an error code that is sequentially blinked out via LED 5 and LEDs 1-3. Only the last error is reported.	
LED 1 to LED 3	will blink together at a slow rate that is easily countable to indicate the error code. This code will be blinked out in incremental sequences and will be repeated with a stop interval of 2 seconds between each error code. Example: If you have fault 3, 6 and 12, the LED 1 to LED 3 will blink together as blinks...stop...6 blinks...stop...12 blinks...repeats incremental sequences. > Please refer to the Blink Code section for a complete blink code listing.
LED 4	will stay off during this condition.
LED 5	5 will blink the error sequences at a faster rate that is not easily countable. The blinking of LED 5 is an indication errors are reported to the upper console.
Note: When error is present at the time of a service call, please record the error sequence for diagnosis purposes and fault reporting	

APPENDIX A: STATUS LED DESCRIPTION (CONT.)

	Motor Control Board Blink Code
1	2.5 VDC REF STATUS
2	1.65 VDC REF STATUS
3	PHASE B CURRENT SENSOR
4	PHASE A CURRENT SENSOR
5	PHASE C CIRCUIT OPEN
6	PHASE B CIRCUIT OPEN
7	PHASE A CIRCUIT OPEN
8	DCLINK BUS OVERVOLTAGE (MAX_VDC1)
9	CRITICAL DCLINK BUS OVERVOLTAGE (MAX_VDC2)
10	DCLINK BUS UNDERVOLTAGE
11	ILLEGAL SPEED COMMAND
12	PHASE OVER CURRENT (RMS)
13	FAULTY SPEED SENSOR
14	HEAT SINK OVER TEMPERATURE
15	OVER TEMPERATURE ON MOTOR OR DRIVE
16	RESERVED
17	BRAKE GATE DRIVER FAULT
18	PHASE A LOW GATE DRIVER FAULT
19	PHASE B LOW GATE DRIVER FAULT
20	PHASE C LOW GATE DRIVER FAULT
21	OUTPUT PEAK OVER CURRENT
22	PHASE A HIGH GATE DRIVER FAULT
23	PHASE B HIGH GATE DRIVER FAULT
24	PHASE C HIGH GATE DRIVER FAULT
25	DCLINK BUS OVERVOLTAGE

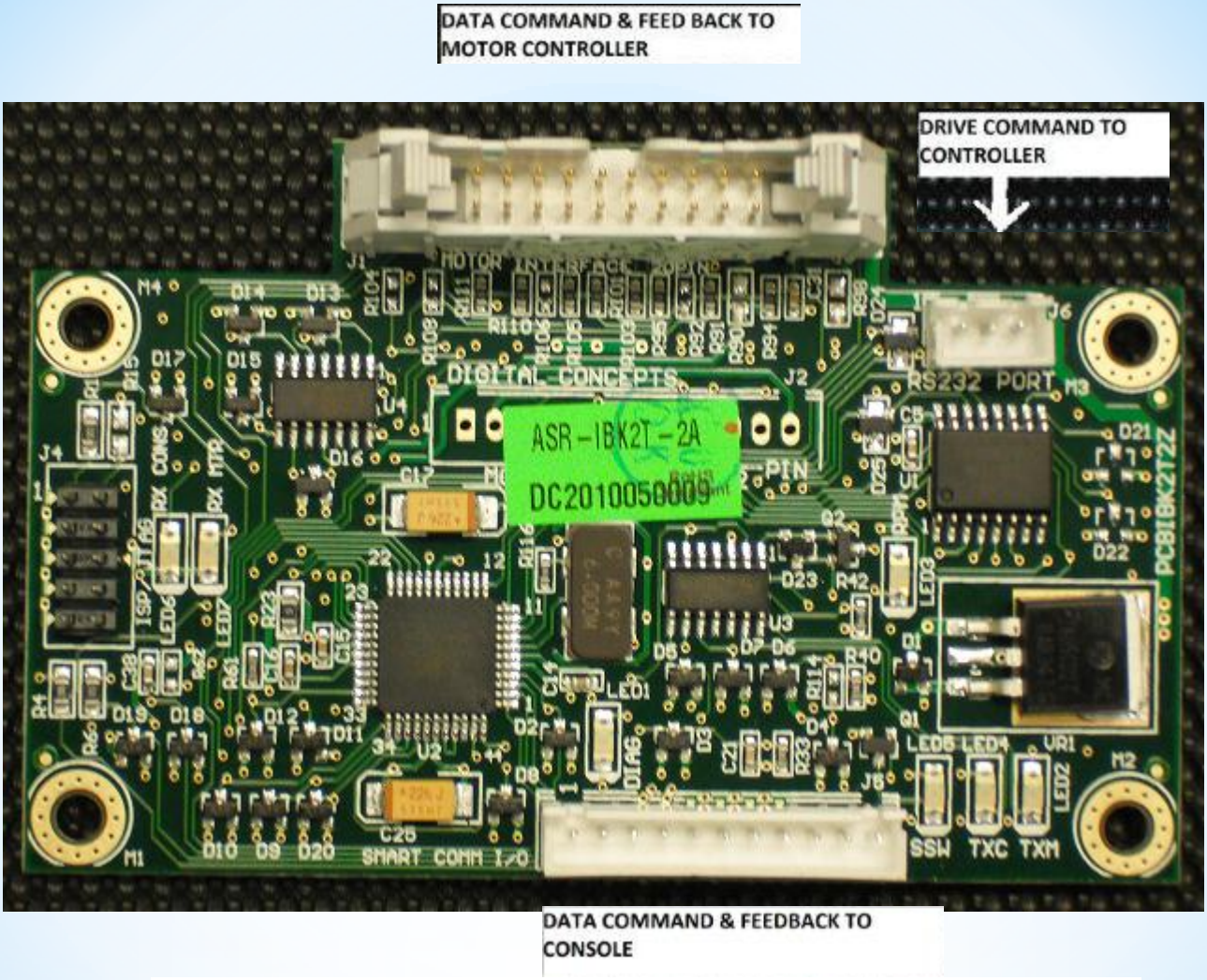
APPENDIX A: STATUS LED DESCRIPTION (CONT.)

1	This error will only appear at start up if it does not see ref voltage	a. Replace controller.
2	This error will only appear at start up if it does not see ref voltage	a. Replace controller.
3	Occurs only at power-up	a. Replace controller.
4	Occurs only at power-up	a. Replace controller.
5	Phase is open	a. Check connections and verify resistance of phase on drive motor. b. Replace drive motor.
6	Phase is open	a. a. Check connections and verify resistance of phase on drive motor. b. Replace drive motor.
7	Phase is open	a. Check connections and verify resistance of phase on drive motor. b. Replace drive motor.
8	The unit will shut down and will display both blink 8 and blink 9	a. Replace speed sensor.
9	If unit displays this error, the unit will shut down and will display both blink 8 and blink 9	a. Replace speed sensor.
10	Under supply voltage Usually caused by incoming power supply being low	a. Check power supply source.
11	Upper board supply immediate 5v command, or there is a short in the controller cable If the PWM LED is illuminated when unit is powered-up, then there is a short in the controller cable or the controller is giving an illegal command	a. Check controller cable and replace b. Replace controller.

APPENDIX A: MOTOR CONTROLLER BLINK CODES

12	Overload condition for 15 seconds	
13	Total loss of speed sensor when unit is running Will not display when unit is not running	a. Replace speed sensor
14	Power devices on controller are overheating	a. Check for proper ventilation and heat-sync compound b. Replace controller
15	Drive motor is overheating	a. Check for proper ventilation Replace drive motor
16	Reserved - Not currently in use	
18	Peak overcurrent	a. Replace controller and drive motor
19	Peak overcurrent	a. Replace controller and drive motor
20	Peak overcurrent	a. Replace controller and drive motor
21	Peak overcurrent	a. Replace controller and drive motor
22	Peak overcurrent	a. Replace controller and drive motor
23	Peak overcurrent	a. Replace controller and drive motor
24	Peak overcurrent	a. Replace controller and drive motor
25	Controller caps overcharge	a. Replace controller

APPENDIX B: SMART CARD LEDS



LED 1 (DIAG): OVERALL STATE OF SYSTEM
GOOD: BLINKS 4X/ SECOND
BAD: BLINKS 1X/ SECOND

LED 2 (TXM): TRANSMISSION TO MTR CTRLR
GOOD: RAPID FLASH
BAD: UNLIT

LED 3 (RPM): DETECTION OF MOTOR MOVEMENT

LED 4 (TXC): TRANSMISSION TO CONSOLE
GOOD: RAPID FLASH
BAD: UNLIT

LED 5 (SSW): SAFETY SWITCH DETECTED

LED 6 (RX CONS): CONSOLE RECEIVING SIGNAL
GOOD: RAPID FLASH
BAD: UNLIT

LED 7 (RX MTR): MTR CTLR RECEIVING SIGNAL
GOOD: RAPID FLASH
BAD: UNLIT

APPENDIX C: CALIBRATION

While the treadmill is in the Calibration Mode the error detection system is not functional to allow for troubleshooting. The treadmills incline will function on command by pressing UP or DOWN, and the speed will function on command by pressing Speed (+) or Speed (-).

The incline digital value and speed command value will display in the upper console as well as actual speed.

To access this mode:

A. **All displays except touchscreen**: remove safety key, turn power switch on, press the up and down grade buttons while inserting the safety key.
B. **Touchscreen display:** Press and hold upper left corner of display. Once TRUE logo flashes, press MANUAL WORKOUT button, press CALIBRATION button.

Note: <u>Do not press start unless you intend to begin the calibration process.</u>

After entering the calibration mode press **Start** to calibrate the treadmill.

1.The unit will begin incline and then decline showing the digital value in the upper console window.

2.The unit's drive motor will begin to move. The upper control panel will test 3 speeds starting-.5 MPH, half speed, max speed. Once the maximum speed is achieved the treadmill will come to a stop and display a message.

3. **Calibration Successful** or **Cal Good** are the preferred messages. If there is a problem with the system an error code will display.

APPENDIX D: TV TUNER SET-UP

TRUE

Assembly Instructions

TV TUNER PROGRAMMING
Analog (NTSC) and Digital (ATSC) Tuner

INITIAL STEPS

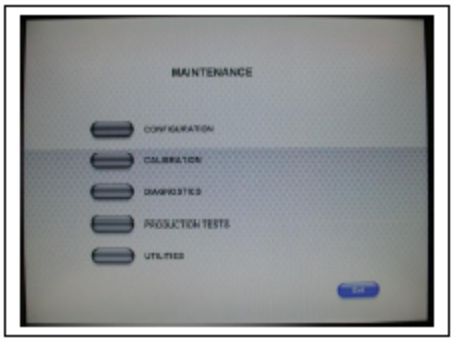
1. If you have not already reviewed and completed the necessary requirements for:
   a) Treadmill Operation on Page 4 or
   b) Bike and Elliptical Operation on Page 9
   please complete these steps at this time if you have not already.
2. Connect video signal source into COAX connector on bottom of exercise equipment.
3. Check that equipment power cord is plugged into wall outlet and where applicable the power switch is set to ON (1 on toggle switch).
4. Allow display to fully light up. Allow a little over a minute for display to fully light up.

ENTERING TV TUNER SETUP

5. The HOME screen will appear as shown below:
6. Press and hold the upper left corner of HOME screen for about 5 seconds until the TRUE logo on HOME screen begins to flash on and off. Stop pressing left corner. See HOME screen image below
7. Then press and hold, for about 5 seconds, the MANUAL WORKOUT key in the bottom right corner of the HOME screen.
   The MAINTENANCE screen will appear at this point.

HOME screen

8. The MAINTENANCE screen will appear as shown here.
   Press the UTILITIES key on the MAINTENANCE screen.



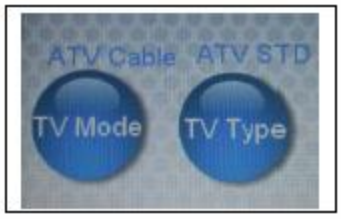
9. The UTILITIES screen will appear as shown. Press the TV TUNER SETUP key on the UTILITIES screen.

10. TV TUNER SETUP screen will appear as below.

11. Determine if the video signal source is Analog or Digital and if it is supplied by Cable or Antenna. Once you have determined this then select the appropriate section below. Verify that you have the settings below selected on the display. If you have different settings from those listed, then simply press the TV MODE or TV TYPE keys to scroll through the settings to arrive at the desired setting.

a) For **Analog TV (NTSC) by Air** (antenna is source) programming:
   i) TV Mode = ATV Air
   ii) TV Type = NTSC

b) For **Analog TV (NTSC) by Cable** (cable is source) programming:
   i) TV Mode = ATV Cable
   ii) TV Type = ATV STD (most common setting)
   NOTE: Depending on your cable provider the ATV STD setting may result in zero channels found. It may be necessary to adjust your TV Type setting to TV Type = ATV HRC or TV Type = ATV IRC.



c) For **Digital TV (ATSC) by Air** (antenna is source) programming:
   i) TV Mode = DTV Air
   ii) TV Type = ATSC

d) For **Digital TV (ATSC) by Cable** (cable is source) programming:
   i) TV Mode = DTV Cable
   ii) TV Type = QAM STD (most common setting)
   NOTE: Depending on your cable provider the QAM STD setting may result in zero channels found. It may be necessary to adjust your TV Type setting to TV Type = QAM HRC or TV Type = QAM IRC.

ENTERING AUTO SCAN PROCEDURE – Analog or Digital Tuner

12. Press START SCAN
    The automatic search screen will scan through channels and list the number of TV channels that are found. The display will show "Searching…..Please Wait. Press Exit (or STOP SCAN) button to cancel."

13. Once the scan procedure has been completed press the CONTROL MENU key.

14. You can scroll through the recently found channels by pressing the CHANNEL + OR – key.
15. If the scanner selected a channel that you do not want then select that channel by using the CHANNEL + OR – key, and then press the DELETE key to remove it from the selection list.
16. This completes the AUTO SCAN PROCEDURE. To exit press the RETURN key to take you back to the HOME screen.

APPENDIX E: WIRELESS BROADCAST VISION CARD SET-UP

TV Programming

1. Note the number of TV's visible in the facility room that you intend to program audio setup for.

►ENTERING TEST MODE (NOTE: STEPS 2 – 4 are time dependent. Press keys quickly)

1. Press and hold the **CLEAR ENTRY** key until display blanks, then quickly proceed to STEP 3.
2. Press and hold the **ENTER** key until you hear a beep, then quickly proceed to STEP 4.
   "ENTER ACCESS CODE" will display.
3. Press the following number keys in sequence **2 0 1 7 3** and press the **ENTER** key.
   "PRODUCTION TEST**"** will display.

►ENTERING BV SETUP MODE

1. Press the **START** key on center pod once so that "VERSION TEST" reads on display.
2. Press the **ENTER** key repeatedly until "BV SETUP" is displayed.
3. Press the **START** key on center pod to enter BV SETUP mode.
   "ENTER PROG MODE" will display.
4. Press the **2** key to select BV Series 2.
   "LOAD BV SERIES 2" will display.

NOTE: These Displays are optimally designed to work with BV transmitters which should be part of this wireless installation. If non-BV transmitters are being used, one should try at this point of these instructions to press **4** to LOAD BV SERIES 4 for Mye®/ Fantaay® transmitters or press 8 to LOAD BV SERIES 8 for Cardio Theater® LCS transmitters or press 9 to LOAD BV SERIES 9 for Cardio Theater® xTV transmitters. This may allow for reception under these circumstances.

WIRELESS SET-UP (cont.)

PROGRAMMING TV PRESET CHANNEL LOCATIONS

Plug stereo headphones into console and wear headphones for remaining steps of TV Programming.

•Programming the first preset channel

1.If you clearly hear the TV audio that want to program in the first preset channel location, then press the **MUTE** key to save it. "SAVE FREQ TO CHAN" will display.

2.If you do not hear the TV audio that you want, press the **VOL Λ** key to select the desired TV transmitter audio, and then press the **MUTE** key to save it.

NOTE: The order in which TV transmitter audio channels are saved determines their displayed TV channel number when in normal display mode. The first TV transmitter audio channel saved will become "TV CHAN 1", and the next TV transmitter audio channel saved will become "TV CHAN 2", etc.

►PROGRAMMING THE NEXT TV PRESET CHANNEL (and remaining channels)

•Repeatedly press the **VOL Λ** key until you hear the TV audio that you want to program, and then press the **MUTE** key to save it. Use this same procedure to program all other preset channel locations for all remaining visible TV's.

If you accidently save TV audio to the wrong preset channel location, press the **SOURCE** key to unsave it. "UNSAVE FREQ IN CH" will display. Then repeat STEP 10 for desired TV audio source.

•To exit programming mode, Press and hold the **CLEAR ENTRY** key until display blanks and resets to normal operate mode.

TV Programming is now complete.

Should you need technical assistance for your TRUE Fitness product contact TRUE Fitness Technical Support at 1-800-883-8783

APPENDIX F: UNIVERSAL CONSOLE MODEL CONFIGURATION PROCEDURE

A. 11” CONSOLE MODEL CONFIGURATION

1. Press and hold the **STOP** key for approximately 4 seconds.
2. The Display will blank out. Immediately release the **STOP** key. Press and hold the **SPEED +** key.
3. Display will read “**ENTER ACCESS CODE**”. If “ENTER ACCESS CODE” does not display, then repeat steps 6 and 7.
4. Within 5 seconds, enter access code 48362. Press **ENTER** key on main display. Display will show “**READING CONFIG**”.
5. After a few seconds, one of four model numbers will display. See list at top of page.
6. Use the **SPEED +** or **–** keys to scroll through the model selection list to select your specific model with or without the decline foot option.
7. After selection, push the **START** key.
8. Display will briefly display “**UPDATING**”
9. Do not hit any other keys. Turn Treadmill power switch OFF and then turn power ON.
10. Calibrate treadmill per the Treadmill Calibration procedure within Console Assembly Instructions

B. TOUCHSCREEN MODEL CONFIGURATION

1. Press and hold upper left corner of display, Once TRUE logo flashes, press MANUAL WORKOUT button
2. MAINTENANCE menu appears.
3. Press the UTILITIES button
4. Press the RESET CONFIGURATION button

APPENDIX G: SOFTWARE INSTALLATION

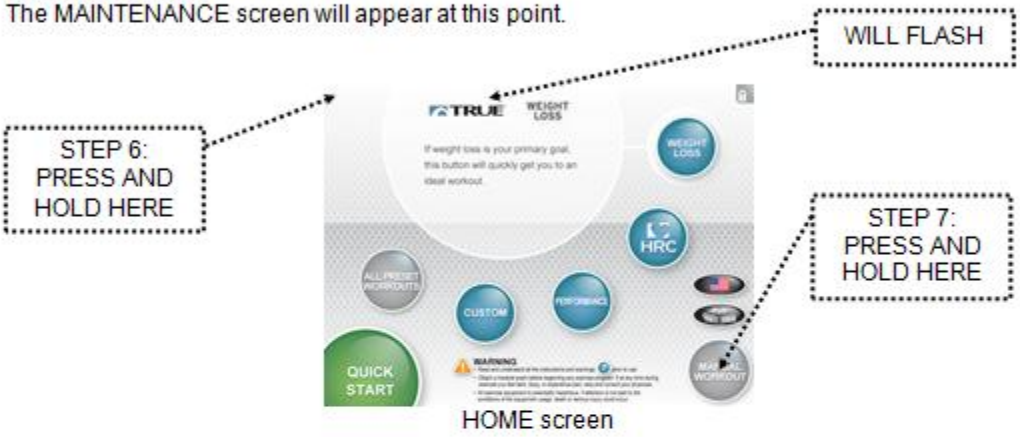
A. 15” Touch Screen Display

TRUE

Software Update Instructions

ENTERING UTILITIES

1. Allow display to fully light up. Allow a little over a minute for display to fully light up.
2. The HOME screen will appear as shown below:
3. Press and hold the upper left corner of HOME screen for about 5 seconds until the TRUE logo on HOME screen begins to flash on and off. Stop pressing left corner. See HOME screen image below.
4. Then press and hold, for about 5 seconds, the MANUAL WORKOUT key in the bottom right corner of the HOME screen.
   The MAINTENANCE screen will appear at this point.



HOME screen

5. The MAINTENANCE screen will appear as shown here.
   Press the UTILITIES key on the MAINTENANCE screen.

6. The UTILITIES screen will appear as shown.
   NOTE: The LOAD SOFTWARE button will be transparent.

Software Installation for Touch Screen

TRUE

Software Update Instructions

7. Insert USB FLASH DRIVE in the front USB port.

8. Once the USB drive has been inserted the LOAD SOFTWARE button will go to a solid state.
NOTE: This can take up to 1 minute for the console To read the flash drive.

WARNING! Once the LOAD SOFTWARE button has been pressed DO NOT REMOVE THE USB FLASH DRIVE or turn off power for any reason.

9. Press the LOAD SOFTWARE button.
NOTE: The software load status will now read LOADING APLICATION.

2

Software Installation for Touch Screen

TRUE

Software Update Instructions

WARNING! DO NOT REMOVE THE USB FLASH DRIVE OR TURN POWER OFF UNTIL SOFTWARE LOAD IS COMPLETE.

10. Once the load is complete the display will automatically return to the home screen, this process may take up to 12 minutes to complete.

The software load is now complete and it is safe to remove the USB FLASH DRIVE.

Please cycle power.

3

B. Software Installation for 2 WINDOW and 11” LCD DISPLAYS

1. Insert the USB storage device in the USB slot
2. Press and hold the STOP button on the center pod assy
3. When the screen blanks out, press and hold CHANNEL UP until the code update appears on the screen
4. Press ENTER (the USB device will begin uploading software
5. When the upload is finished the screen will return to the normal screen
6. Remove USB device from console